

Application No. 10/528,298
Amendment Dated September 18, 2008
Reply to Office Action Dated April 18, 2008

Remarks

Claims 11-19 are pending.

Claims 11-19 stand rejected.

Claims 11 and 14-19 are amended.

Claim 13 has been cancelled.

Claims 11-12 and 14-19 are submitted herein for review.

No new matter has been added.

In paragraph 1 of the Office Action, the Examiner has continued the rejection of dependent claim 16 under 35 U.S.C. § 112 because the Examiner has continued the assertion that the term “semiaromatic” renders the claim indefinite. Applicants respectfully disagree.

As noted in the prior Amendment, the term “semiaromatic” is used in the art of polymer compositions to denote a polymer that has both aromatic portions as well as aliphatic portions. Such a term does not render the claim indefinite. The term “semiaromatic” covers any polymer that has both aromatic portions as well as aliphatic portions, but it is not indefinite as it definitely defines a group of polymers (ie. polymers that have aromatic portions as well as aliphatic portions).

In view of this, Applicants respectfully disagree with the Examiner’s rejection and request that the rejection of claim 16 under 35 U.S.C. § 112 be withdrawn.

Turning to the substantive rejection, in paragraph 2 of the Office Action, the Examiner

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has continued the rejection of independent claim 11, under 35 U.S.C. § 102(b) as being anticipated by Robertson (U.S. Patent No. 4,766,194). Applicants respectfully disagree with the Examiner's contentions and submit the following remarks in response.

The present invention, as claimed in independent claim 11 is directed to a process for preparing a self lubricating varnish comprising a modified polymer having a base polymer to which is attached a pendant aliphatic chain containing at least 15 carbon atoms. The method includes preparing a modified diisocyanate, to which is attached a pendant aliphatic chain containing at least 15 carbon atoms, by reacting an isocyanate functional group of a triisocyanate with a terminal functional group of an aliphatic chain. This process is carried out in a solvent medium with stirring and heating. The modified diisocyanate is mixed with at least one difunctionalized monomer containing two functional groups which are reactive with the isocyanate functional groups of the modified diisocyanate to carry out the synthesis of the modified polymer.

As noted in the prior Amendment, an improved low friction varnish is achieved for use in various coated wires, such as those used in electric motor applications. As claimed in independent claim 11, the process for producing this lubricating varnish is achieved in a two step process. The first step in the process is to prepare the modified diisocyanate by reacting an isocyanate functional group of a triisocyanate with a terminal functional group of an aliphatic chain. The second step is then to mix the modified diisocyanate with at least one difunctionalized monomer containing two functional groups which are reactive with the isocyanate functional groups of the modified diisocyanate.

The prior art attempts to meet the problems of producing a self lubricating polymer, such as those taught in the Miyake reference, are made from a polymer of polyamide-imide polyester

or polyester-imide type, the polymer being modified by comprising an alkyl end group having a linear chain of 21 to 31 carbon atoms. These polymers are made in single mixing steps See paragraphs [0006] through [0008] of the present invention.

However, as noted in paragraph [0009] of the present application, according to the abrasion tests presented, the extent to which this self-lubricating varnish, when applied to a conducting wire, can be overcoated is low. Because of this adhesion problem, the varnish cannot be applied in two or more passes, without detriment to the mechanical properties of the enameled conducting wire.

The use of the two step process of one embodiment of the present invention as claimed provides a simplified process and also avoids the problems of the prior art of producing an ineffective lubricating capability of the varnish because there is no risk of preventing the formation of a long polymeric main chain by polycondensation and hence of limiting the performance of the self-lubricating insulating varnish. See paragraphs [0028] and [0029] of the present invention.

The cited prior art, namely Robertson describes a process for preparing an outer shell for bowling balls that exhibit a reduced coefficient of friction (See col. 1, lines 9-17). In Robertson, the outer shell is fabricated in a single mixing step that includes the mixing of:

1. a triisocyanate ("biuret (i)" - col.6, lines 6-7),
2. a terminal functional group of an aliphatic chain ("slip agent (iii)" such as a fatty alcohols containing from 10-40 carbon atoms - col. 6, lines 31-33), and
3. an active hydrogen-containing compound (ii) including polyether polyols, polyester polyols and amine terminated polyethers – (col. 3, lines 22-24).

In Robertson, the reactants are liquid and mixed in a solvent medium heating of the mixture is not directly discussed, only the temperature of each reactants is disclosed (col. 13, lines 25-30). The product obtained by this mixture is a polyurethane, a polurea or a polyurethaneurea (col. 2, lines 24-25).

The cited prior art, namely Miyake, describes a process for preparing a wire enamel composition in a single mixing step, by mixing:

1. diisocyanate (“diphenylmethane-4,4’-diisocyanate” – page 15, line 12);
2. a terminal functional group of an aliphatic chain (“montan wax acid having a chain length of 28 to 32 ” – page 15, line14-15); and
3. one difunctionalized monomer containing two functional groups which are reactive with the isocyanate functional groups of the diisocyanate (“trimellitic anhydride” – page 15, line 13).

The preparation of this composition in Miyake is carried out in a solvent medium (“N-methyl-2-pyrrolidone” – page 15, line 16) with heating (“170°C” - page 15, line 20.

However, none of the prior art, either alone or in combination with one another, teach or suggest all of the elements of independent claim 11. For example, there is no teaching or suggestion in either one of Robertson or Miyake that disclose the formation of a low friction varnish using a two step process, including preparing the modified diisocyanate by reacting an isocyanate functional group of a triisocyanate with a terminal functional group of an aliphatic chain; *and then mixing the modified diisocyanate with at least one difunctionalized monomer containing two functional groups which are reactive with the isocyanate functional groups of the modified diisocyanate.*

For at least this reason, Applicants submit that the cited prior art does not teach or

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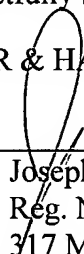
suggest all of the elements of the prior art as claimed in independent claim 11, and respectfully request that the rejection of this claim be withdrawn. As claims 12 and 14-19 depend from claim 11, Applicants request that the rejection of these claim be withdrawn as well for at least the same reasons.

In view of the foregoing, Applicants respectfully submit that pending claims 11-12 and 14-19 are in condition for allowance, the earliest possible notice of which is earnestly solicited. If the Examiner feels that an interview would facilitate the prosecution of this Application he is invited to contact the undersigned at the number listed below.

Respectfully submitted,

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